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Botanical work of Dr. E. W. Hilgard

ROLAND M. HARPER

Dr. Eugene Woldemar Hilgard, who was born in Zweibrücken, Bavaria, January 5, 1833, and died in Berkeley, California, three days after his eighty-third birthday, was a shining example of a versatile type of scientist, common in the nineteenth century but becoming scarce in these days of increasing specialization. He was best known as a soil investigator and agronomist, but also ranked high as a geologist and chemist, and was pretty well versed in systematic and geographical botany. He was one of the pioneers in the correlation of soils with vegetation in America, and always emphasized the importance of native vegetation as an indicator of the productivity of soils. The fact that the scientific study of soils is almost inseparable from that of plant ecology was more fully appreciated by him than by most American soil investigators now living (some of whom seem to have little or no botanical training, if one may judge by their writings).

His first contribution to botanical science was his 415-page report on the geology and agriculture of Mississippi, published in 1860. In that the soils and vegetation of the several geographical divisions of the state (except the alluvium of the Mississippi River) were described in considerable detail, and it was at the time and for years afterward the best account of Mississippi vegetation in existence. As it was written before the publication of Chapman's *Flora of the Southern United States*, when there were no very satisfactory manuals for that part of the country (the best available being Darby's), some of the plants were wrongly identified, but a reader familiar with the southern flora can easily make the necessary corrections for himself.

A somewhat similar treatment was employed in a 44-page pamphlet on a geological reconnaissance of Louisiana, published in New Orleans in 1869, and in his descriptions of Mississippi, Louisiana and California, in the fifth and sixth volumes of the Tenth Census (1884), which have never received the attention from botanists that they deserve.

In Garden and Forest for March 7 and June 13, 1888, he had short papers on California forest trees; and a longer account of the weeds of that state by him appeared in the California Experiment Station Report for 1890 (pp. 238-252) and, almost simultaneously, in several numbers of Garden and Forest during the second half of 1891. His paper on the *ciénagas* of southern California, published in the Bulletin of the Geological Society of America in 1892 and in the California Experiment Station Report for 1892-1894, is of some botanical interest, as are several papers on deserts and alkali lands in various publications. His review of Fernald's "Soil preferences of alpine plants," in Science for January 24, 1908, shows an intimate knowledge of ecological principles.

His text-book on Soils, with 620 pages and numerous illustrations, published in 1906, is practically a summary of all his researches, and contains much that is of interest and value to botanists.* He contributed many papers on cultivated plants to the reports and bulletins of the California Experiment Station (of which he was director from 1888 to 1904), which it is hardly worth while to enumerate separately.

In the line of botanical discoveries, he is credited by Chapman (Fl. So. U. S. ed. 2, 658. 1883) with being the first to find *Eriocaulon septangulare* in the South.† During his geographical explorations for the "Northern Transcontinental Survey" in Montana and Washington in 1882 he collected a few plants, at least one of which turned out to be undescribed; this was named *Oenothera Hilgardi* by Greene (Bull. Torrey Club 10: 41. 1883) and afterwards transferred to *Sphaerostigma* by Small (see Piper, Contr. U. S. Nat. Herb. 11: 18, 406. 1906).

The writer, after corresponding with Dr. Hilgard for several

* See review in *Torrey* 7: 170-175. Aug. 1907; and comments in Bull. Torrey Club 40: 377 *et seq.* Aug. 1913.

† The plant so determined, if collected on his trip to southeastern Mississippi in the spring or early summer of 1859, as seems most likely, may have been another species, perhaps *E. lineare* Small, which was not distinguished until 1903 (see Bull. Torrey Club 32: 461-463; 33: 527). For *E. septangulare* grows mostly on sandy shores of lakes and ponds, and blooms in late summer, while *E. lineare* is a typical pine-barren plant, and blooms in April and May. The only southern stations for *E. septangulare* known to the writer are in Lowndes County, Georgia, and Leon, Walton and Santa Rosa Counties, Florida. In Small's Flora it is said to range west to Texas, but this statement lacks verification.

years, had the pleasure of meeting him at his home in Berkeley at the time of the A. A. A. S. meetings last summer, and found him somewhat enfeebled by age but wide-awake mentally. He always wrote for publication in plain simple language, as free as possible from technicalities, and was very modest, sincere and unaffected, as befits a great scientist.

Accounts of his life and work by two of his California colleagues were published in *Science* for March 31, 1916, and reprinted with some additions, two portraits, and a bibliography of over 250 titles, in the *University of California Chronicle*, vol. 18, no. 2 (this also issued in June as a separately paged pamphlet with 50 pages). Other recent biographical sketches are in the *Experiment Station Record* (Washington) for March, 1916, and the *Geographical Review* (New York) for May. The last contains references to a few earlier ones.

COLLEGE POINT, NEW YORK